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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Marianne Hammer-Altmann

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8406

26646

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EXAMINER

KOSLOW, CAROL M

ART UNIT

PAPER NUMBER

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,913	<b>Applicant(s)</b> HAMMER-ALTMANN ET AL.	
	<b>Examiner</b> C. Melissa Koslow	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-17 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-17 and 20-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/29/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

This action is in response to applicants' amendment of 7 January 2008. The amendments to the specification have overcome the objection to the disclosure with respect to "Nb" on page 3 and the objection to the specification. The amendments to the claims have overcome the 35 USC 112 rejections over claims 16-19, 21 and 22 and claim 12, which respect to niobium and the art rejection over the article by Cheng et al. Applicant's arguments with respect to the remaining rejections have been fully considered but they are not persuasive.

The amendment to the claims filed on 7 January 2008 does not comply with the requirements of 37 CFR 1.121(c) because "[9]" in claim 21 is not underlined. Amendments to the claims filed on or after July 30, 2003 must comply with 37 CFR 1.121(c) which states:

(c) *Claims*. Amendments to a claim must be made by rewriting the entire claim with all changes (e.g., additions and deletions) as indicated in this subsection, except when the claim is being canceled. Each amendment document that includes a change to an existing claim, cancellation of an existing claim or addition of a new claim, must include a complete listing of all claims ever presented, including the text of all pending and withdrawn claims, in the application. The claim listing, including the text of the claims, in the amendment document will serve to replace all prior versions of the claims, in the application. In the claim listing, the status of every claim must be indicated after its claim number by using one of the following identifiers in a parenthetical expression: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New), and (Not entered).

(1) *Claim listing*. All of the claims presented in a claim listing shall be presented in ascending numerical order. Consecutive claims having the same status of "canceled" or "not entered" may be aggregated into one statement (e.g., Claims 1-5 (canceled)). The claim listing shall commence on a separate sheet of the amendment document and the sheet(s) that contain the text of any part of the claims shall not contain any other part of the amendment.

(2) *When claim text with markings is required*. All claims being currently amended in an amendment paper shall be presented in the claim listing, indicate a status of "currently amended," and be submitted with markings to indicate the changes that have been made relative to the immediate prior version of the claims. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. Only claims having the status of "currently amended," or "withdrawn" if also being

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amended, shall include markings. If a withdrawn claim is currently amended, its status in the claim listing may be identified as “withdrawn—currently amended.”

(3) *When claim text in clean version is required.* The text of all pending claims not being currently amended shall be presented in the claim listing in clean version, *i.e.*, without any markings in the presentation of text. The presentation of a clean version of any claim having the status of “original,” “withdrawn” or “previously presented” will constitute an assertion that it has not been changed relative to the immediate prior version, except to omit markings that may have been present in the immediate prior version of the claims of the status of “withdrawn” or “previously presented.” Any claim added by amendment must be indicated with the status of “new” and presented in clean version, *i.e.*, without any underlining.

(4) *When claim text shall not be presented; canceling a claim.*

(i) No claim text shall be presented for any claim in the claim listing with the status of “canceled” or “not entered.”

(ii) Cancellation of a claim shall be effected by an instruction to cancel a particular claim number. Identifying the status of a claim in the claim listing as “canceled” will constitute an instruction to cancel the claim.

(5) *Reinstatement of previously canceled claim.* A claim which was previously canceled may be reinstated only by adding the claim as a “new” claim with a new claim number.

The disclosure is objected to because of the following informalities:

The composition of the piezoelectric ceramic is unclear. The phrases “PZT-based” and “doped” does not clearly define the composition of the ceramic. A PZT can contain rare earth metal as substituents or dopants, such as lead lanthanum zirconate titanates, or it can contain subcomponents that are not part of the PZT perovskite structure, which are also known as dopants in the art. Applicants need to clarify the composition discussed in the specification. The table on page 6 state RB-doping is doping as in WO 02/55450 or U.S. patent 6,773,621. The actual doping composition is not disclosed and WO 02/55450 or U.S. patent 6,773,621 do not define any specific composition as RB-doped. Thus the actual composition tested is unclear. “Perovskite” is misspelled on page 1, line 20 and in the substitute for this paragraph. Appropriate correction is required.

The amendments to the specification do not clarify what is meant by “PZT based”. While one of ordinary skill would know these ceramic contain lead, titanium and zirconium and have a

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perovskite structure, it is unclear what other components can be present in the ceramic, such as can the lead be substituted, can there be other “B” components, beside zirconium and titanium, such as zinc niobate or is there secondary materials present in the ceramic besides those listed. Applicants' comments with respect to “dopant” are noted, but it does not clarify applicants' definition since, as discussed above, “dopant” has two different meanings in the art. Finally, applicants' comments with respect to RB dopant is not understood since U.S. patent 6,773,621 never uses the term "RB" in column 3, line 23 to column 4, line 19.

Claims 16 and 17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the method of increasing the elongation values of the piezoelectric ceramic of WO 02/55450 or U.S. patent 6,773,621, does not reasonably provide enablement for increasing the elongation values for all PZT compositions doped with combination of elements selected from Ca, La, Nb, Fe and Cu. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Pages 5 and 6 discuss the elongation values for neodymium doped PZT and the piezoelectric ceramic of WO 02/55450 or U.S. patent 6,773,621, where the actual composition, is not clearly defined. These are the examples are the only showings of elongation values. Such a limited disclosure does not support the breadth of the instant claims.

Applicants' arguments have been considered but are not convincing since there is no reasonable correlation between the limited disclosure of the table on page 6 and the scope of claims 16 and 17 where measurement conditions are not defined, and the ceramic is any PZT

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based ceramics containing any doping amount of combinations of Ca, La, Nb, Fe and Cu, which simply means at least two of these elements are present. The rejection is maintained.

Claims 9-15 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 is indefinite as to what are the ions that are mixed. Claim 10 is indefinite since the claimed salts are not lithium in ionic form and claim 9 requires adding ionic lithium to the calcined mixture. Claims 11-15 recite the limitation "PZT compounds" and "the PZT base material". There is insufficient antecedent basis for this limitation in the claims or in claim 9 from which they depend. In addition, it is unclear what is meant by "PZT compounds simply doped using"... "used as the PZT base material". The brackets around "9" in claim 21 should be deleted. Finally, claim 21 is indefinite since claim 9 is not directed to a piezoelectric ceramic material. Claim 9 is directed to a method for making ceramic material.

Applicants' arguments have been considered but do not overcome the rejection. While the Examiner realizes that the ions are from the oxides and carbonates, these oxides and carbonates are not defined and thus the ions from these oxides and carbonates are not clearly defined. With respect to applicant's argument about the rejection to claim 10, the Li in salts is not a ion since it does not have a charge. Lithium in ionic form is  $\text{Li}^+$ . Applicants' assertion that "simply doped" means mono-doped is not supported by any evidence and thus does not overcome the rejection. Applicants' comments do not clarify what is meant by "PZT base or "PZT base material" as discussed above. The rejections are maintained.

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 9-13 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,993,895.

This reference teaches adding a lithium salt to PLZT powder, which is a lanthanum doped PZT ceramic. While the reference does not teach how the PLZT is produced, it is notoriously well known in the art that this material is conventionally produced by mixing oxides of lead, lanthanum, zirconium and titanium and calcining the mixture. Table 1 teaches adding 0.84 and 1 wt% lithium nitrate, which is 0.084 and 0.1 wt% ionic lithium. The reference teaches the claimed process. Since the taught composition and process are identical to that claimed, the taught ceramic must have a sintering temperature in the ranges of claims 9 and 20, absent any showing to the contrary.

Claims 9-13 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,993,895.

This reference teaches adding a lithium salt to PLZT powder, which is a lanthanum doped PZT ceramic. While the reference does not teach how the PLZT is produced, it is notoriously well known in the art that this material is conventionally produced by mixing oxides of lead, lanthanum, zirconium and titanium and calcining the mixture. The lithium salt can be lithium nitrate or lithium carbonate and the amount is 0.5-10 wt%. If the salt is lithium nitrate, the ionic amount of lithium added is 0.05-1 wt% and if the salt is lithium carbonate, then the amount of ionic lithium is 0.095-1.9 wt%. These ranges overlap the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious

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under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference teaches the composition has a sintering temperature of not greater than 1100°C, which encompasses the claimed range. In addition, since the taught and claimed compositions overlap and the taught and claimed processes are the same, one of ordinary skill in the art would expect the taught ceramic to have an overlapping sintering temperature range, absent any showing to the contrary. This reference teaches the ceramic is used to form a multilayered capacitor having internal electrodes. This structure is the same as an actuator and thus the capacitor would also act as an actuator in different applications. While the taught electrodes are composed of silver/palladium alloy, it is well known in the art that silver is a functionally equivalent electrode material that also requires the sintering temperature to be less than 1100°C. Thus it would have been obvious to use a silver electrode in place of the taught alloy. In addition, it would have been obvious to use the taught capacitor/actuator in a motor vehicle fuel injection system since this is a well known use of piezoelectric actuators. The reference suggests the claimed process, actuator and system.

With respect to the sintering temperature, the reference teaches sintering at temperature of not greater than 1100°C, which overlaps that claimed. The fact the examples teach sintering at 1000°C and 1100°C does not mean that it cannot be sintered in the claimed range. Applicants are reminded a reference is not limited to its examples. With respect to the method of making the ceramic, as stated above, one of ordinary skill in the art would be expected to know that such ceramics are conventionally made by mixing oxide and carbonates of lead, lanthanum, titanium and zirconium and firing the mixture and that the ceramic in the reference must have been



produced by this conventional method. Applicants have not presented any evidence to rebut this. The rejections are maintained.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/cmk/  
March 19, 2008

/C. Melissa Koslow/  
Primary Examiner  
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